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(71) Applicant (for all designated States except US): **DI-  
VERSA CORPORATION** [US/US]; 4955 Directors  
Place, San Diego, CA 92121 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **STEER, Brian**  
[CA/US]; 1136 Missouri Street, San Diego, CA 92109  
(US). **CALLEN, Walter** [US/US]; 3469 Stetson Avenue,  
San Diego, CA 92122 (US). **HEALEY, Shaun** [US/US];  
3380 Harding Street, #7A, Carlsbad, CA 92008 (US).  
**PULLIAM, Derrick** [US/US]; Syngenta Biotechnology,  
Inc., 3054 Cornwallis Road, Research Triangle Park, NC  
27709 (US).

(74) Agents: **EINHORN, Gregory, P.** et al.; Morrison and Fo-  
erster LLP, 3811 Valley Centre Drive, Suite 500, San Diego,  
CA 92130-2332 (US).

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(54) Title: GLUCANASES, NUCLEIC ACIDS ENCODING THEM AND METHODS FOR MAKING AND USING THEM

(57) Abstract: The invention relates to polypeptides having glucanase, e.g., endoglucanase, mannanase, xylanase activity or a com-  
bination of these activities, and polynucleotides encoding them. In one aspect, the glucanase activity is an endoglucanase activity  
(e.g., endo-1,4-beta-D-glucan 4-glucano hydrolase activity) and comprises hydrolysis of 1,4-beta-D-glycosidic linkages in cellulose,  
cellulose derivatives (e.g., carboxy methyl cellulose and hydroxy ethyl cellulose) lichenin, beta-1,4 bonds in mixed beta-1,3 glucans,  
such as cereal beta-D-glucans or xyloglucans and other plant material containing cellulosic parts. In addition, methods of designing  
new enzymes and methods of use thereof are also provided. In alternative aspects, the new glucanases e.g., endoglucanases, man-  
nanases, xylanases have increased activity and stability at increased pH and temperature.